

WHAT IS CLAIMED IS:

1. A hydraulic control system of a six-speed automatic transmission for a vehicle, the automatic transmission including first, second, and third clutches and first and second brakes, the hydraulic control system comprising:

5 a line pressure control portion stably maintaining hydraulic pressure supplied from an oil pump and varying a line pressure according to driving conditions;

a launch control portion for controlling a torque increase of a torque converter and for controlling a damper clutch;

10 a pressure reduction control portion for reducing line pressure and for outputting the reduced line pressure as control pressure;

a shift control portion for distributing a plurality of range pressures of a manual valve to the clutches and the brakes;

a fail safe control portion for controlling hydraulic supply from the shift control portion to the clutches and the brakes;

15 wherein the shift control portion comprises first, second, third, and fourth pressure control valves respectively controlled by a reduced pressure of the reducing valve and controlled pressures of first, second, third, and fourth solenoid valves, for controlling at least one of the forward and reverse range pressures of the manual valve and thereby for supplying the controlled pressure to at least one frictional element.

20 2. The hydraulic control system of claim 1, wherein the fail safe control portion comprises:

25 a switch valve controlled by a control pressure of a solenoid valve and a plurality of control pressures selectively supplied from the manual valve, for selectively supplying hydraulic pressure received through an input port to a plurality of output ports;

a first fail safe valve controlled by hydraulic pressure supplied from the second pressure control valve and the forward range pressure supplied from the manual valve, for selectively transmitting a hydraulic pressure from the third pressure control valve; and

30 a second fail safe valve controlled by line pressure and hydraulic pressures from the second pressure control valve and the first fail safe valve, for selectively

transmitting a hydraulic pressure from the switch valve.

3. The hydraulic control system of claim 1, wherein the manual valve comprises:

a line pressure line connected to the regulator valve;

5 a reverse range pressure line for supplying a reverse range pressure in a reverse speed of the automatic transmission; and

a forward range pressure line for supplying the forward range pressure in forward speeds of the automatic transmission.

4. The hydraulic control system of claim 1, wherein:

10 the first pressure control valve is connected to the first clutch that is operated in forward first, second, third, and fourth speeds;

the second pressure control valve is connected to the second clutch that is operated in forward third and fifth speeds, and is also connected to the first and second fail safe valves so as to supply control pressures thereto;

15 the third pressure control valve is connected to the second brake that is operated in forward second and sixth speeds interposing the first fail safe valve, and is also connected to the second fail safe valve so as to supply control pressure thereto; and

20 the fourth pressure control valve is connected to the third clutch that is operated in forward fourth, fifth, and sixth speeds interposing the switch valve, and is also connected to the first brake that is operated in forward first speed and a reverse speed interposing the switch valve and the second fail safe valve.

5. The hydraulic control system of claim 1, wherein:

the first and third pressure control valves respectively control the forward range pressure of the manual valve; and

25 the second and fourth pressure control valves respectively control the forward range pressure in forward speeds of the automatic transmission and the reverse range pressure in the reverse speed of the automatic transmission.

6. The hydraulic control system of claim 1, wherein the switch valve is simultaneously connected, at its upstream side, to a forward range pressure line and a

reverse range pressure line of the manual valve, interposing a shuttle valve.

7. The hydraulic control system of claim 1, wherein the switch valve comprises a valve body and a valve spool disposed therein,

wherein the valve body of the switch valve comprises:

5 a first port for selectively receiving the forward range pressure and the reverse range pressure as control pressure;

a second port for receiving hydraulic pressure from the fourth pressure control valve;

10 a third port for supplying the hydraulic pressure received through the second port to the third clutch;

a fourth port for supplying the hydraulic pressure received through the second port to the second fail safe valve;

15 a fifth port for receiving a control pressure from the on/off solenoid valve, and the valve spool of the switch valve selectively communicates the second port to the third and fourth ports, under the control of control pressures received through the first and fifth ports.

8. The hydraulic control system of claim 1, wherein the first fail safe valve comprises a valve body and a valve spool disposed therein,

wherein the valve body of the first fail safe valve comprises:

20 a first port for partially receiving a hydraulic pressure that is being supplied to the second clutch;

a second port for receiving hydraulic pressure from the third pressure control valve;

25 a third port for supplying the hydraulic pressure received through the second port to the second brake; and

a fourth port for receiving the D range pressure as a control pressure, and

the valve spool of first fail safe valve selectively communicates the second port with the third port, under the control of control pressures received through the first and fourth ports.

30 9. The hydraulic control system of claim 1, wherein the second fail safe

valve comprises a valve body and a valve spool disposed therein,

wherein the valve body of the second fail safe valve comprises:

a first port for partially receiving a hydraulic pressure that is being supplied to the second clutch;

5 a second port for partially receiving a hydraulic pressure that is being supplied to the second brake;

a third port for receiving hydraulic pressure from the fourth pressure control valve;

10 a fourth port for supplying the hydraulic pressure received through the third port to the first brake; and

a fifth port for receiving the line pressure as a control pressure, and

the valve spool of the second fail safe valve selectively communicates the third port with the fourth port, under the control of control pressures received through the first, second, and fifth ports.